

Product Information

VESTAMID® EX9350 BK E70293

HEAT- AND WEATHER-RESISTANT, IMPACT-MODIFIED POLYAMIDE 612 ELASTOMER FOR EXTRUSION

VESTAMID® EX9350 BK E70293 is a PA 612 elastomer extrusion compound developed for the manufacturing of tubing systems, e.g. vacuum brake booster lines.

The compound is in particular suitable for applications, that require a continuous high flexibility even if subjected to high temperature load. In contrast to conventionally plasticized materials (plasticizerloss) tubes made from VESTAMID® EX9350 BK E70293 do not stiffen under elevated temperatures.

In comparison with PA 11 and PA 12 compounds the increased melting point allows for increased peak temperatures in use.

The compound is especially suitable for the extrusion of tubing systems that are exposed to increased burst pressures and service temperatures.

The process temperatures should be within a range of 210 to 240 °C.

VESTAMID® EX9350 BK E70293 is supplied as cylindrical pellets in moisture-proof packaging, ready for use.

Pigmentation may affect values.

Inside the original and undamaged packaging, the product has a shelf life of at least 2 years when stored in dry rooms at temperatures not exceeding 30°C.

Key Features

Industrial Sector

Automotive and Mobility, Industry and Engineering

Processing

Extrusion

Delivery form

Pellets, Granules

Electrical

Insulating

Conformity

Automotive

Additives

Unfilled

Resistance to

Heat (thermal stability), UV / light / weathering, Oil / fuels

Mechanical properties ISO	dry / cond	Unit	Test Standard
Tensile modulus	630 / 480	MPa	ISO 527
Tensile strength	30 / 26	MPa	ISO 527
Yield stress	30 / 26	MPa	ISO 527
Yield strain	30 / 31	%	ISO 527
Stress at 50% strain	29 / 25	MPa	ISO 527
Stress at break	41 / 42	MPa	ISO 527
Nominal strain at break, tB	330 / 360	%	ISO 527
Charpy impact strength, +23°C	N / N	kJ/m ²	ISO 179/1eU
Charpy impact strength, -30°C	N / N	kJ/m ²	ISO 179/1eU
Charpy impact strength, -40°C	N / -	kJ/m ²	ISO 179/1eU
Charpy notched impact strength, +23°C	30 / 130	kJ/m ²	ISO 179/1eA
Type of failure	P / P	-	-
Charpy notched impact strength, 0°C	20 / -	kJ/m ²	ISO 179/1eA
Type of failure	C / -	-	-
Charpy notched impact strength, -30°C	8 / 6	kJ/m ²	ISO 179/1eA
Type of failure	C / C	-	-
Flexural modulus, 23°C	615 / 455	MPa	ISO 178
Flexural stress at conv. deflection, 23°C	19 / 16	MPa	ISO 178
Flexural strength, 23°C	28 / 26	MPa	ISO 178
Flexural strain at flexural strength, 23°C	9 / 10	%	ISO 178
Flexural stress at break, 23°C	N / N	MPa	ISO 178
Flexural strain at break, 23°C	N / N	%	ISO 178

Mechanical properties (TPE)	dry / cond	Unit	Test Standard
Stress at 5% elongation	22.5 / -	MPa	ISO 527
Stress at 10% elongation	27.6 / -	MPa	ISO 527
Stress at 20% elongation	30 / -	MPa	ISO 527
Stress at 50% elongation	28.6 / -	MPa	ISO 527
Stress at 100% elongation	29.4 / -	MPa	-
Stress at 300% elongation	50.2 / -	MPa	ISO 527
Strain at break TPE	276 / -	%	ISO 527
Stress at break TPE	46.5 / -	MPa	ISO 527

Thermal properties	dry / cond	Unit	Test Standard
Melting temperature	198 / *	°C	ISO 11357-1/-3
Glass transition temperature, DSC	-4 / *	°C	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	50 / *	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	130 / *	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	186 / *	°C	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	130 / *	°C	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	122 / *	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, normal	140 / *	E-6/K	ISO 11359-1/-2
Melting Temperature	198	°C	ASTM D 3418

Physical properties	dry / cond	Unit	Test Standard
Density	1050 / -	kg/m ³	ISO 1183
Water absorption	1.1 / *	%	Sim. to ISO 62
Humidity absorption	3.5 / *	%	Sim. to ISO 62
Shore D hardness	67 ^[b] / 67 ^[b]	-	ISO 7619-1
Density	1050	kg/m ³	ASTM D 792

b: 3 seconds

Burning Behav.	dry / cond	Unit	Test Standard
Burning behav. at 1.5 mm nom. thickn.	HB / *	class	IEC 60695-11-10
Thickness tested	1.6 / *	mm	-
Burnin behav. at thickness h	HB / *	class	IEC 60695-11-10
Thickness tested	3.2 / *	mm	-

Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity, V	8.6E8 / 6E7	Ohm*m	IEC 62631-3-1
Surface resistivity, C, circular electrodes	7E11 / 6.8E11	Ohm per square	IEC 62631-3-2
Relative permittivity, 50Hz	9.2 / -	-	IEC 62631-2-1
Relative permittivity, 100Hz	8.3 / -	-	IEC 62631-2-1
Relative permittivity, 1MHz	3.4 / -	-	IEC 62631-2-1
Dissipation factor, 50Hz	3540 / -	E-4	IEC 62631-2-1
Dissipation factor, 100Hz	2940 / -	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	616 / -	E-4	IEC 62631-2-1
Dielectric strength, AC, S20/S20, t. 1 mm	35 / 26	kV/mm	IEC 60243-1
CTI, test solution A, 50 drops value	575 / -	-	IEC 60112
Assessment of the insulation group	II	-	DIN EN 60664-1

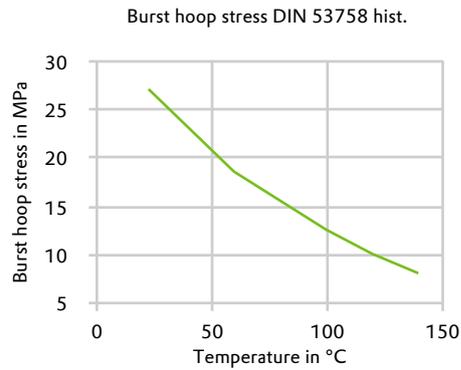
Rheological properties	dry / cond	Unit	Test Standard
Melt volume-flow rate, MVR	56 / *	cm ³ /10min	ISO 1133
Temperature	280 / *	°C	-
Load	2.16 / *	kg	-
Molding shrinkage, parallel	1.1 / *	%	ISO 294-4, 2577
Molding shrinkage, normal	1.0 / *	%	ISO 294-4, 2577
Mold temperature	35 / *	°C	-
Melt temperature	240 / *	°C	-

Pipes Properties	dry / cond	Unit	Test Standard
Impact strength with pendulum, pipe, -40°C	N / *	J	DIN 73378
Tube dimension, OD x WT	12x1,25 / *	mm	DIN 73378
Cold impact resistance, breaks of 10, -40°C, 880g	0 / *	-	Sim. to VW Audi PV 3905
Tube dimension, OD x WT	12x1,25 / *	mm	Sim. to VW Audi PV 3905
Burst hoop stress, 23°C, H2O	27 / *	MPa	DIN 53758, historical

Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	250	°C	ISO 294
Injection Molding, mold temperature	80	°C	ISO 294
Injection Molding, injection velocity	200	mm/s	ISO 294

Diagrams

Burst hoop stress DIN 53758 hist.



Characteristics

Applications

Tube and hose

Color

Black

Processing

Profile extrusion, Pipe/Tube extrusion

Additives

Impact resistant, Heat stabilizer

Special Characteristics

High impact strength, Light-stabilized, High heat resistant

Chemical Media Resistance

Acids

- ✓ Acetic Acid (5% by mass) (23°C)
- ✓ Citric Acid solution (10% by mass) (23°C)

Bases

- ✓ Sodium Hydroxide solution (35% by mass) (23°C)
- ✓ Sodium Hydroxide solution (1% by mass) (23°C)

- ✓ Ammonium Hydroxide solution (10% by mass) (23°C)

Alcohols

- ✓ Isopropyl alcohol (23°C)
- ✓ Methanol (23°C)
- ✓ Ethanol (23°C)

Hydrocarbons

- ✓ n-Hexane (23°C)
- ✓ Toluene (23°C)
- ✓ iso-Octane (23°C)

Ketones

- ✓ Acetone (23°C)

Ethers

- ✓ Diethyl ether (23°C)

Mineral oils

- ✓ SAE 10W40 multigrade motor oil (23°C)
- ✓ Insulating Oil (23°C)

Standard Fuels

- ✓ ISO 1817 Liquid 1 (60°C)
- ✓ ISO 1817 Liquid 2 (60°C)
- ✓ ISO 1817 Liquid 3 (60°C)
- ✓ ISO 1817 Liquid 4 (60°C)
- ✓ Standard fuel without alcohol (pref. ISO 1817 Liquid C) (23°C)
- ✓ Standard fuel with alcohol (pref. ISO 1817 Liquid 4) (23°C)
- ✓ Diesel fuel (pref. ISO 1817 Liquid F) (23°C)
- ✓ Diesel fuel (pref. ISO 1817 Liquid F) (90°C)
- ✓ Diesel EN 590 (100°C)

Salt solutions

- ✓ Sodium Chloride solution (10% by mass) (23°C)
- ✓ Sodium Carbonate solution (20% by mass) (23°C)
- ✓ Sodium Carbonate solution (2% by mass) (23°C)
- ✓ Zinc Chloride solution (50% by mass) (23°C)

Other

- ✓ Ethyl Acetate (23°C)
- ✓ Hydrogen peroxide (23°C)
- ✓ DOT No. 4 Brake fluid (120°C)
- ✓ Water (23°C)